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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,582	07/11/2003	Suresh Sawant	8303.0063	3681

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EXAMINER

SELLERS, ROBERT E

ART UNIT PAPER NUMBER

1712

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/617,582	<b>Applicant(s)</b> SAWANT ET AL.	
	<b>Examiner</b> Robert Sellers	<b>Art Unit</b> 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-58 is/are pending in the application.  
     4a) Of the above claim(s) 8-29 and 43-58 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 30-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-58 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/1/03 &amp; 10/25/04</u> | 6) <input type="checkbox"/> Other: ____.  |

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-7 and 30-42, drawn to an epoxy-capped polythioether, classified in class 568, subclass 39.
  - II. Claims 8-17 and 43-58, drawn to an epoxy-capped polythioether containing a multivalent radical, classified in class 568, subclass 41.
  - III. Claims 18-22, drawn to the epoxy-capped thioether of Group I and a curing agent, classified in class 528, subclass 376.
  - IV. Claims 23-29, drawn to the epoxy-capped thioether of Group II and a curing agent, classified in class 525, subclass 119.

The inventions are distinct from each other because:

2. The presence of the multivalent radical B and secondary hydroxyl group in the structural formula of the epoxy-capped polythioether of Group II as depicted in claim 8 forms a materially different reactive backbone from that of the structural formula of Group I as represented in claim 1.
3. Inventions (I or II) and (III or IV, respectively) are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a coating formulation and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants.

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

4. The blend of Group III contains a structurally and functionally distinct epoxy-capped polythioether from that of Group IV as explained in paragraph 2 hereinabove.

Restriction for examination purposes as indicated is proper because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

5. This application contains claims directed to the following patentably distinct species of the claimed invention:

a) Contingent upon the election of Group I or III, the epoxy-capped polythioether having the structural formula of claim 1 wherein  $R^1$  and  $R^2$  are specified.

b) Contingent upon the election of Group II or IV, the epoxy-capped polythioether having the structural formula of claim 8 wherein  $R^1$ ,  $R^2$  and B are identified.

c) Contingent upon the election of Group III or IV, the curing agents of claim 19 or claim 25, respectively, wherein a particular chemical name and/or formula is revealed.

d) The presence or absence of the catalyst of claims 39-42 or claims 55-58, wherein if its presence is elected, a particular species is designated.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species ***within each of the appropriate items a) to d) hereinabove*** for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-58 are generic.

A reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

6. During a telephone conversation with Diane Meyers on August 24, 2005, a provisional election was made with traverse to prosecute the invention of Group I wherein in the structural formula of claim 1, R<sup>1</sup> is dimercaptodooxaoctane, R<sup>2</sup> is diethyleneglycol divinyl ether and the catalyst is present and is 2,2'-azobis(2-methylbutyronitrile, Vazo 67 , claims 1-7 and 30-42. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-29 and 43-58 are withdrawn from further consideration under 37 CFR 1.142(b) as being drawn to non-elected inventions.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 and 30-42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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7. The species of R<sup>3</sup>, X and R<sup>4</sup> in the structural formula of claim 1, lines 8-10 as well as claim 30, lines 9, 10 and 12 are not properly defined in the absence of the Markush language "selected from the group consisting of."

8. The term "type" used to characterize the azo catalyst in claim 42 does not concisely denote the catalyst since the term embraces modifications and/or derivatives not contemplated.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7 and 30-42 are rejected under 35 U.S.C. 102(b) as being anticipated by Hickner Patent No. 4,104,283.

9. Hickner (col. 1, lines 25-26) discloses polythioetherpolyepoxides prepared by the reaction of a polythiol such as bis(2-mercaptoethyl)sulfide or 1,8-dimercapto-3,6-dithiaoctane (col. 2, lines 38-39, synonymous with the species of claims 2 and 31) and an unsaturated monoepoxide such as allyl glycidyl ether in the presence of a free-radical catalyst such as an organic peroxide or azonitrile (col. 3, lines 3-11). Based on the equivalent method of reaction between Hickner and the claims involving the same dithiol and unsaturated monoepoxide reactants, the polythioetherpolyepoxide of Hickner inherently possess a structure with the formula of claim 1.

Claims 1-7 and 30-38 are rejected under 35 U.S.C. 102(e) as being anticipated by Gross et al. Patent No. 6,800,371.

10. Gross et al. shows polythioether diepoxides obtained via the reaction of dimercaptodiethyl sulfide (col. 6, lines 20-22, DMDS and cols. 8-9, Example 1) or 1,8-dimercapto-3,6-dioxaoctane (col. 6, lines 25-27, DMDO and cols. 9-10, Example 3) and allyl glycidyl ether in the presence of 2,2-dimethoxy-2-phenylacetophenone (col. 6, lines 36-39, Irgacure 651) represented by Structures 1 and 3 within the limits of the structural formula of claim 1 wherein  $R^2$  is  $-\text{CH}_2-$  and  $R^1$  is  $[-(\text{CHR}^3)_p-\text{X}]_q-(\text{CHR}^3)_r-$  wherein  $R^3$  is H and X is O or S.



Claims 1, 3-7, 30 and 32-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Greenlee Patent No. 3,454,539.

11. Greenlee (col. 2, lines 26-28) describes polythioxepoxides derived from the reaction of polymercaptans containing at least two mercaptan groups positioned no more than six carbon atoms from a negative activating group such as sulfide (-S-) or ether (-O-) groups (col. 2, lines 64-70) or 1,4-butanedithiol (col. 4, lines 1-2 and col. 8, Example 20) with an olefin epoxide such as allyl glycidyl ether (col. 7, lines 65-66), limonene monoxide (col. 8, lines 29-30) or vinyl-3,4-epoxycyclohexane (Example 20) possessing the structure exhibited in column 3, lines 52-56 which is encompassed by the structural formula of claim 1.

Claims 1, 3, 7, 30, 32 and 36-38 are rejected under 35 U.S.C. 102(a) with respect to the Journal of Applied Polymer Science article by Lu et al., or 35 U.S.C. 102(b) regarding Wirth et al. Patent No. 4,931,576, CAPLUS accession no. 2001:875915 to Lu et al. or Japanese Patent Nos. 2000-186086 or 2000-137307 or CAPLUS accession no. 1999:441993 to Ergozhin et al. as being anticipated.

12. Each of the references show bis( $\beta$ -epoxypropylthioethyl)sulfide conforming to the structural formula of claim 1 wherein  $R^2$  is  $-CH_2-$  and  $R^1$  is  $-CH_2CH_2-$  (See for example Wirth et al., col. 5, line 46 and Chemical abstracts registry no. 103296-84-0 on page 2 of Ergozhin et al). Claims 3, 30 and 32 are directed to a epoxy-capped polythioether obtained from an epoxy olefin (claims 3 and 32) or formed by reacting a (cyclo)alkylene dithiol with an epoxy olefin which constitutes product-by-process claims.

According to MPEP § 2113, "Product-by-Process Claims":

"[E]ven though the product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d. 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

"Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d. 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)."

13. The bis( $\beta$ -epoxypropylthioethyl)sulfide fall within the structural formula of claim 1.

Therefore, the epoxy-capped polythioether of the references are the same as that claimed.

Claims 1, 3, 7, 30, 32 and 36-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent Nos. 10-114764 (Japanese '764) or 2000-186086 (Japanese '086)

14. Japanese '764 (Japanese patent, page 1, formula (I)) or Japanese '086 (CAPLUS abstract, page 3, registry no. 103296-84-0) shows 1,2-bis(glycidylthio)ethane within the confines of the structural formula of claim 1 wherein  $R^2$  is  $-\text{CH}_2-$  and  $R^1$  is  $-\text{CH}_2\text{CH}_2-\text{S}-$  (within the ambit of  $[-(\text{CHR}^3)_p-\text{X}]_q-(\text{CHR}^3)_r$  wherein  $R^3$  is H, p is 2, X is S and r is 2). The patents apply to product-by-process claims 3, 30 and 32 for the reasons espoused in paragraphs 9 and 10 hereinabove.

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Claims 1, 3, 7, 30, 32 and 36-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Japanese Patent No. 11-180977 (Japanese '977).

15. Japanese '977 CAPLUS abstract, page 3, registry no. 230950-21-7) shows bis( $\beta$ -epoxypropylthioisopropyl)sulfide embraced by the structural formula of claim 1 wherein  $R^2$  is  $-\text{CH}_2-$  and  $R^1$  is  $-\text{CH}_2\text{CH}(\text{CH}_3)-$ . The patents apply to product-by-process claims 3, 30 and 32 for the reasons espoused in paragraphs 9 and 10 hereinabove.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeMoss et al. Patent No. 6,372,849.

16. DeMoss et al. (col. 4, lines 41-44) espouses a reaction product of a polyvinyl ether monomer such as the elected species of diethylene glycol divinyl ether (col. 5, lines 12-13) and preferably dimercaptodiethylsulfide (DMDS) or dimercaptodioxaoctane (DMDO) (col. 6, lines 25-28) which yields a terminal vinyl groups-containing polymer subsequently reacted to incorporate epoxy groups (col. 6, lines 50-52).

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17. The claimed bonding of of an epoxyalkyl group to the sulfur atom in the structural formula of claim 1 is not recited. It would have been obvious to incorporate the epoxy groups into the terminal vinyl groups-containing polythioether polymer of DeMoss et al. via reaction with an unsaturated epoxide which addition reacts with the vinyl groups to provide an epoxyalkyl moiety within the parameters of R<sup>2</sup>.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Sellers whose telephone number is (571) 272-1093. The examiner can normally be reached on Monday to Friday from 9:30 to 6:00. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).



Robert Sellers  
Primary Examiner  
Art Unit 1712

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9/2/2005